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ABSTRACT

A study was conducted to test the hypothesis that metaphorical thought develops according to the principles governing other categorizing processes. Of particular interest were the questions of whether preschool children possess the categorical flexibility to comprehend metaphorical statements and, if they do, whether this flexibility manifests itself across the perceptual, functional, and affective domains simultaneously or at different stages in development. In total, 150 predominantly middle- to upper-middle-class subjects (15 males and 15 females from each of several grade levels) participated in the study. Subjects were enrolled either in kindergarten; in third, sixth, or ninth grades; or in college. Eight sets of metaphors were used in the study, with each set containing eight metaphors beginning with the same "topic" (X) term within the statement "X is (a) Y." "Vehicle" (Y) terms were varied to convey perceptual, functional, or affective similarities between topic and vehicle. (For example, the items "eyes are marbles," "eyes are cameras," "and "eyes are shy children" illustrate, respectively, a perceptual, functional, and affective metaphor.) Matching foils were created for each genuine metaphor by leaving topics intact and substituting words of similar vocabulary to create nonsensical expressions. Subjects were asked to listen to each of 48 items, say "yes" if the item made sense to their imagination or if it could go in a story or poem, and say "no" otherwise. Results were found to challenge prevailing opinions concerning the development of metaphor comprehension. (RH)

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DEVELOPMENTAL CHANGES IN METAPHOR COMPREHENSION: IT'S NOT ALL UPHILL

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Many theorists conceptualize metaphoric thought as distinct from rational thought. Werner termed it "primitive;" Piaget separated it from "operative" thought, labelling it "figurative;" and even Gardner who has produced many insightful studies of the metaphoric process stated that persons in the creative arts "do not need formal operations ...[for they] do not deal with ... artistic objects in propositional form" (1973, p. 308).

Paradoxically, although metaphoric thought has been isolated from the hypothetico-deductive processes, it also has been elevated in that most theorists regard it as beyond the ken of young children. Although many metaphors have been collected from children spontaneously and experimentally (e.g., Chukovsky, 1968; Gardner, Kircher, Winner, & Perkins, 1975; and Winner, McCarthy, & Gardner, 1980), researchers tend to concur that prior to adolescence, children lack fully developed metaphoric capabilities. Gardner and his co-workers (Gardner, Winner, Bechoffer, & Wolf, 1978) refer to young children's metaphors as "wild." Piagetians such as Cometa and Eson (1977) assert that true metaphoric competence requires the development of intersectional classification.

This paper neither separates metaphoric thought from "opera-

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tional" thought nor assumes that it requires special mental processes which do not emerge until adolescence. Instead, it proposes that one generates and processes metaphors according to the principles of categorization. Consider the fact that Aristotle described metaphor as the process of finding similarities among dissimilars. This very process begins with birth for we must parse "this blooming mass of confusion" into manageable units. To quote Mervis and Rosch (1981, pp. 84 & 100), "Categorization may be considered one of the most basic functions of living creatures....Relying on the correlated attribute cluster serves to make the world seem more orderly than it really is."

The surprising, "tensive" quality of metaphors probably accounts for theorists' tendency to treat metaphoric thought as a distinct process. Because new metaphors strike us as novel, we assume that a novel thought process generated them. We forget that at one time to refer to tables, compasses, and journeys as having "legs" or to call a radioactively contaminated worker "hot" probably struck listeners as quite bizarre.

Concerning the second assumption made of metaphoric thought--that it does not blossom until adolescence--often methodological faults undermine the data that support this conclusion. Many studies of metaphor ask subjects to <u>prove</u> how much they know by explaining the meanings of their own or others' metaphors. Such demands turn studies of metaphor into studies of metacognition. In addition, the syntax, abstractness, and vocabulary difficulty of test materials have varied in metaphor studies in such a way as to minimize the chances of a young child succeeding with those metaphors considered by the experimenter to be most cognitively advanced. One must be chary of such methodo-

logical confounds for they promote behavior akin to concluding that children have not yet developed a motor system because they cannot yet drive a car.

This study, therefore, investigates the development of metaphor with two goals: 1) to test the validity of the hypothesis that metaphoric thought develops according to the principles governing other categorizing processes and 2) to do so using a task that assesses young children's metaphoric capacity with materials and in domains most likely to elicit their maximal performance.

In assessing the kinship of metaphoric thought and categorization, two general bodies of data offer guidance in constructing hypotheses concerning the development of metaphoric thought--the data concerning the acquisition of word-meaning and the data concerning the development of object-sorting. In so far as categorization serves as the foundation of naming, when infants formulate word-reference systems, they generate categories. Likewise, when children sort objects into coherent groups, they indicate that they possess criteria for uniting discrete stimuli.

For some time, investigators of language acquisition have debated about the criteria which children first use to determine a word's referents. Originally Nelson (1974) asserted that the functions of objects underly children's earliest definitions whereas Anglin (1977) and Clark (1973) asserted that the perceptual attributes of objects underly children's earliest definitions. Although both camps seem to be modifying their positions, the nature of the debate suggests a systematic way to approach metaphor. One may gain fresh insight into the nature of metaphoric thought by considering the various domains or grounds

which metaphors may tap in expressing similarity. It may be that humans are born with the ability to to metaphorize--that is, to see communalities among disparate concepts--but that the domains in which one perceives similarity increase or alter with development.

Studies of object-sorting tend to support the hypothesis that children's earliest groupings draw on perceptual similarities primarily. Over the last two decades children from a variety of cultures have been asked to sort objects or pictures or to explain the ways in which a series of words resemble each other. Although lack of schooling and rural, as opposed to urban environments, can retard or restrict development, generally one finds an identical pattern. Until the first-grade or so, children sort objects primarily on the basis of perceptual similarities. After that, functional groupings steadily increase until supplanted by nominal or taxonomic groupings (see Bruner, Olver, & Greenfield, 1966).

At this point the audience may be struck by this paper's neglect of a domain often believed to comprise the heart of metaphor, affect. Most theorists (e.g., Connor & Kogan, 1980; Ortony, 1979; and Osgood, 1980) would agree with Gardner and his co-workers that "a special characteristic of the range of figurative language is its potential for involving individuals in the affective realm" (Gardner et al., 1978, p. 29). In fact, studies of actual metaphor have slighted functionally grounded similarity relations, concentrating upon perceptual and affective (also called "psychological/physical") metaphors. The previously mentioned tendency for theorists to conceive of metaphoric thought as intuitive and non-rational probably accounts for this neglect

of function and emphasis on affect. In fact, those who believe that metaphors derive from primary-process thought even might predict that metaphors based on affective associations would emerge developmentally prior to or concomitant with those based on perceptual and functional associations.

However, in studies of children's language acquisition, object-sorting, and spontaneously produced metaphors, affect manifests only a weak role. Nelson and her co-workers (Nelson, Rescorla, Gruendel, & Benedict, 1978) and Rescorla (1980) do report overextensions which appear to be metaphors based on children's similar feelings about two referents, but this type of overextension does not occur nearly as frequently as perceptual and functional overextensions. Also, in studies of object-sorting, rarely do either persons reputed to be "primitive" or Western individualists use their feelings about objects as unifying criteria (see, Bruner, Olver, & Greenfield, 1966, p. 287). Furthermore, studies of children's spontaneously generated metaphors, suggest that perceptual metaphors require less cognitive or emotional maturation than affective ones since they occur soon after the onset of language whereas affective metaphors rarely occur until the late preschool years.

Summarizing these studies of various types of classificatory behavior, all concur that from early in development perceptual similarities are used as grouping criteria. Studies of metaphoric language generally ignore functionally grounded metaphors and regard formal operations as essential to fully developed affectively grounded metaphors. In contrast, studies of language acquisition and object-sorting tend to find little evidence of affective groupings and to agree that functional similarities

become as or more salient than perceptual similarities by the early years of school.

However, since all three areas of inquiry do note at least occasional instances of groupings based on perception, function, and affect, if one were to devise a test situation in which children need not choose between types of metaphor but only need assess them individually, all three types might be more evenly represented.

Therefore, this study asked: a) by preschool-age, do children possess the categorical flexibility to comprehend metaphorical statements and, if so, b) does this flexibility manifest itself across the perceptual, functional, and affective domains simultaneously or at different stages in development? Given the data reviewed above, this study predicted that even the youngest subjects would possess a system for distinguishing genuine metaphors from nonsense ones and that metaphors based on perceptual similarities would be first understood by children, later to be equalled or surpassed by metaphors based on functional similarities. Also, given the relative paucity of affective associations in other types of grouping behavior, it predicted that among all subjects, affective metaphors would be least frequently accepted although the overall percentage might increase with age.

Given the author's criticisms of previous metaphor studies, she attempted to develop metaphors based on <u>perceptual, functional, or affective grounds</u> that were kept as parallel as possible in all other ways. Eight sets of metaphors were selected from a larger pool written and rated by separate groups of college students. All metaphors were worded in concrete vocabulary familiar to children and followed the syntax of a copula, "X is

[a] Y." Each set contained eight metaphors beginning with the same "X" term, commonly known as the "topic." The "Y" terms, known as "vehicles," varied in order to convey either perceptual, functional, or affective similarities between the "topic" and "vehicle." For example, the items "eyes are marbles," "eyes are cameras," and "eyes are shy children" illustrate a perceptual, functional, and affective metaphor respectively. In addition, matching foils were created for each genuine metaphor by leaving the topics intact and substituting words of similar vocabulary in place of the vehicles such that raters judged the expressions to be nonsensical. Metalinguistic demands were minimized by merely asking subjects to listen to each of the resulting randomly recorded 48 items and to say "yes" if it made sense to their imagination, if it could go in a story or poem, and to say "no" otherwise. In total, 150 predominately middle- to upper-middle-class subjects participated in the study--15 females and 15 males each--from kindergarten, the third-, sixth-, and ninth-grades,and from college. Using a mixed-model analysis of variance with repeated measures, F tests revealed the following significant results:

1. All age-groups, even kindergartners, distinguished genuine metaphors from foils ($p < .001$).

2. Paralleling the developmental course typical of other categorizing responses, between kindergarten and the third-grade, subjects reversed from accepting more perceptual than functional metaphors to accepting more functional than perceptual metaphors ($p < .05$).

3. Subjects accepted fewer affective metaphors than perceptual ones over all ages ($p < .001$).

4. Despite a general increase in the rate of acceptance of all metaphor types from kindergarten to college, between the sixth- and ninth-grade, Age interacted with Ground ($p < .01$) because the number of acceptances decreased slightly for perceptual metaphors, continued to increase for functional metaphors, and decreased dramatically for affective metaphors.

5. Investigation of an Age by Sex interaction ($p < .001$) between the sixth- and ninth-grades revealed that the decrements were significant for males only.

These data challenge the prevailing opinions concerning the development of metaphor comprehension. First of all, although kindergartners identified fewer genuine metaphors overall than older subjects, even they appear to possess a rudimentary metaphoric system. They accepted no more foils than older subjects and they accepted a significantly greater number of instances of genuine metaphors than foils because of responses to all three types of grounds. This argues against the notion that young children are "wild" or limited to fewer types of categorical relations than older persons when dealing with metaphor.

Furthermore, the dramatic increase in metaphor appreciation that most theorists postulate arises during adolescence concomitant with the emergence of Piagetian formal operations did not apppear. Instead, although subjects' acceptance of each type of metaphor approximately doubled between kindergarten and college, half or more of each increase took place between kindergarten and the third grade (52%, 73%, and 59% for perceptual, functional, and affective metaphors respectively).

Moreover, adolescents, especially boys, appear to reduce their acceptance of metaphors. Why should this occur? Certainly

it contradicts our idealized notion that development proceeds steadily uphill, that we get bigger and better with time. Although no other studies of the development of metaphoric skill report sex differences, quite a few describe similar setbacks in performance, usually around the sixth-grade (see Gardner et al., 1978; Pollio, Barlow, Fine, & Pollio, 1977; and Pollio & Pickens, 1980). Also, children's performance on tasks measuring creativity and artistic sensitivity often suffers such declines in early- to mid-adolescence (see Gardner, 1973; Gowan, 1981; and Torrance, 1975, 1981).

Gardner (1973) and Gowan (1981) speculate that formal operations dull figurative operations and that right-hemisphere functions may be overpowered or may atrophy due to our culture's emphasis on left-hemisphere functions such as reading, writing, and arithmetic. Those who investigate creativity probably would be uncomfortable with such explanations because they often regard scientists and other stereotypically left-brain, linear thinkers as exemplary creators. Also, they tend to blame low creativity on <u>how</u> we are taught, not <u>what</u> we are taught. Empirically, the fact that a person's performance on many of these tasks can be enhanced with the proper training or encouragement belies the notion that one type of thought has been sacrificed in the service of another.

Furthermore, it seems counter-evolutionary to posit that one type of thought is sacrificed to another. Instead it seems plausible that when children leave behind school's early years of show-and-tell, finger painting, and story-telling for a regimen demanding "right" answers, conformity to norms, and logic rather than whimsy, they might respond by narrowing their categories'

breadth and by reducing their tolerance for deviant ideas. As children become more focused on facts instead of feelings), concerned with appearing grown-up, and involved with objects and how they work, functional metaphors and other functional categorizations should continue to flourish whereas affective metaphors might decline, especially among boys slouching towards manhood.

However, if the diminution of adolescents' metaphoric boundaries reported here and elsewhere in the literature represents a widespread phenomenon, perhaps curricula should be developed that model and elicit open-ended as well as rote work. Such work need not be limited to the arts. In science and history, for example, students can be taught to imagine antecedents, consequences, and alternate outcomes as well as to memorize formulae and dates. Surely in an era of such rapid technological expansion, we need innovation more than ever. Moreover, even if originality and creativity prove irrelevant to progress, as the Russian poet, Voznesensky, said, "The art of creation is older than the art of killing."

Figure for: DEVELOPMENTAL CHANGES IN METAPHOR COMPREHENSION: IT'S NOT ALL UPHILL," by Kita Shantiris, SRCD, April, 1983.

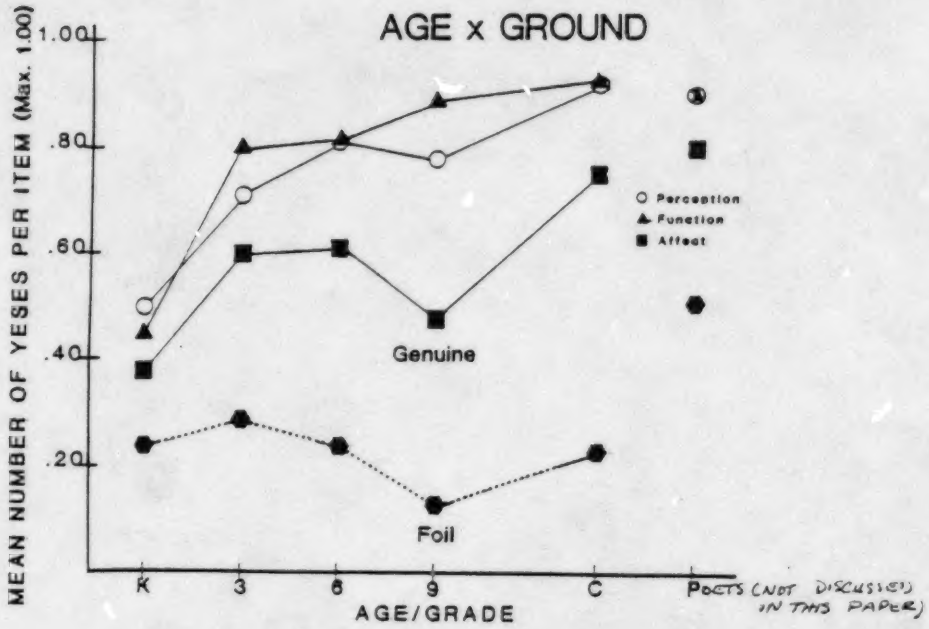
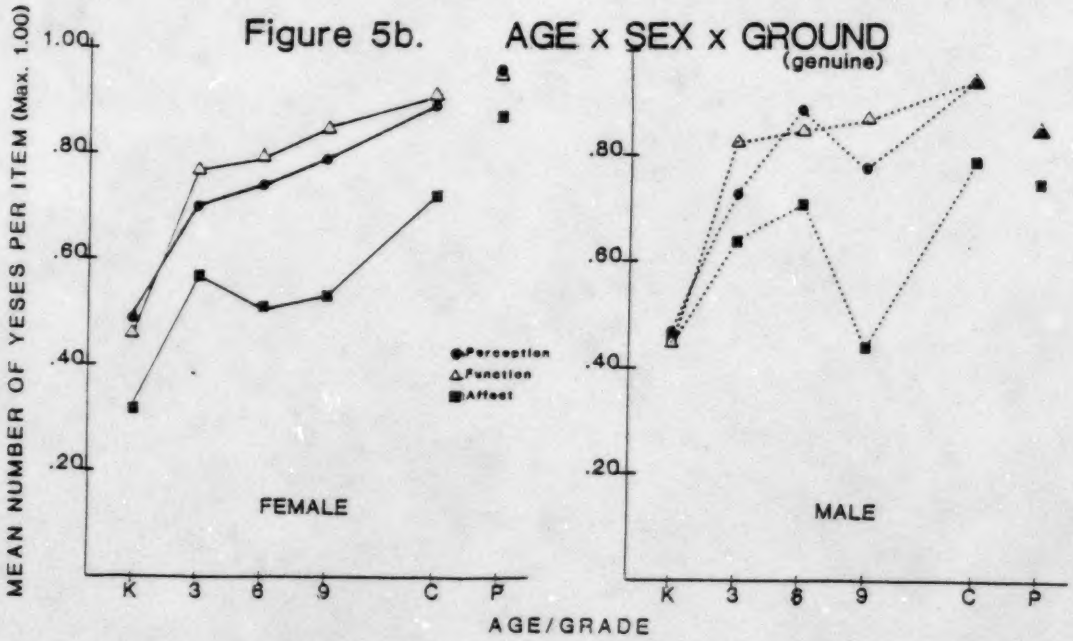


Figure 5b.



REFERENCES

Anglin, J. Word, Object, and Conceptual Development. New York: W. W. Norton, 1977.

Benedict, H. Early lexical development: Comprehension and production. Journal of Child Language, 1979, 5, 183-200.

Billow, R. M. A cognitive developmental study of metaphor comprehension. Developmental Psychology, 1975, 11, 415-423.

Bruner, J. S., Olver, R. R., and Greenfield, P. M. Studies in Cognitive Growth. N. Y.: John Wiley, 1966.

Chukovsky, K. From Two to Five. Berkeley: University of California Press, 1968.

Clark, E. What's in a word? On the child's acquisition of semantics in his first language. In T. Moore (Ed.), Cognitive Development and the Acquistion of Language. N. Y.: Academic Press, 1973.

Cometa, M. S., and Eson, M. E. Logical operations and metaphor interpretation: A Piagetian model. Child Development, 1978, 49, 649-659.

Connor, K., and Kogan, N. Topic-vehicle relations in metaphor: The issue of asymmetry. In R. P. Honeck and R. R. Hoffman (Eds.), Cognition and Figurative Language, Hillsdale, N. J.: Lawrence Erlbaum, 1980.

Gardner, G. The Arts and Human Development. N. Y.: John Wiley, 1973.

Gardner, H., Kircher, M., Winner, E., and Perkins, D. Children's metaphoric productions and preferences. Journal of Child Language, 1975, 2, 125-141.

Gardner, H., Winner, E., Bechhoffer, R., and Wolf, D. The development of figurative language. In K. E. Nelson (Ed.), Children's Language (Vol. 1). N. Y.: Gardner Press, 1978.

Goldin-Meadow, S., Seligman, M., and Gelman, R. Language in the two-year old. Cognition, 1976, 4, 189-202.

Gowan, J. C. The use of developmental stage theory in helping gifted children to become creative. In J. C. Gowan, J. Khatena, and E. P. Torrance (Eds.), Creativity and Its Implications (2nd ed.). Dubuque,

Iowa: Kendall/Hunt, 1981.

Greenfield, P. M., and Smith, J. H. Communication and the Beginnings of Language: The Development of Semantic Structure in One-word Speech and Beyond. N. Y.: Academic Press, 1976.

Mervis, C. B., and Rosch, E. Categorization of natural objects. Annual Review of Psychology, 1981, 32, 89-115.

Nelson, K. Concept, word, and sentence: Interrelations in acquisition and development. Psychological Review, 1974, 81, 267-285.

Nelson, K., Rescorla, L., Gruendel, J., and Benedict, H. Early lexicons: What do they mean? Child Development, 1978, 49, 960-968.

Ortony, A. The role of similarity in similes and metaphors. In A. Ortony (Ed.), Metaphor and Thought. Cambridge: Cambridge University Press, 1979.

Osgood, C. E. The cognitive dynamics of synesthesia and metaphor. In R. P. Honeck and R. R. Hoffman (Eds.), Cognition and Figurative Language. Hillsdale, N. J.: Lawrence Erlbaum, 1980.

Pollio, H. R., Barlow, J. M., Fine, H. H., and Pollio, M. R. Psychology and the Poetics of Growth. Hillsdale, N. J.: Lawrence Erlbaum, 1977.

Pollio, M. R., and Pickens, J. D. The developmental structure of figurative competence. In R. P. Honeck and R. R. Hoffman (Eds.), Cognition and Figurative Thought. Hillsdale, N. J.: Lawrence Erlbaum, 1980.

Rescorla, L. A. Overextension in early language development. Journal of Child Language, 1980, 7, 321-335.

Torrance, E. P. Discontinuities in creative development. In E. P. Torrance and W. F. White (Eds.), Issues and Advances in Educational Psychology. Itasca, Ill.: F. E. Peacock, 1975.

Torrance, E. P. Cross-cultural studies of creative development in seven selected societies. In J. C. Gowan, J. Khatena, and E. P. Torrance (Eds.), Creativity and Its Educational Implications (2nd ed.). Dubuque, Iowa: Kendall/Hunt, 1981.

Winner, E., McCarthy, M., and Gardner, H. The ontogenesis of metaphoric language. In R. P. Honeck and R. R. Hoffman (Eds.), Cognition and Figurative Language. Hillsdale, N. J.: Lawrence Erlbaum, 1980.